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SIR H. JOHNSTON'S BRITISH MAMMALS.

British Mammals; an Attempt to Describe and Illustrate the Mammalian Fauna of the British Islands from the Commencement of the Pleistocene Period to the Present Day. By Sir H. Johnston. Woburn Library. Pp. xvi+405; illustrated. (London: Hutchinson and Co., 1903.) Price 12s. 6d.

UNLIKE the birds, the mammals of our islands have not been "written out," and there was accordingly abundant room for a thoroughly up-to-date and trustworthy work on this section of the British fauna, which should record all that has been accomplished in connection with the subject during the last ten years or so, and especially with regard to local races, or subspecies, of well-known types. Whether the author has been successful in satisfactorily filling the gap that lay before him it is our purpose to inquire.

In the first place, it may be candidly admitted that in this handsome and strikingly illustrated addition to the "Woburn Library" the author has succeeded in producing an extremely interesting and attractive volume, as, indeed, from his well-known literary skill and experience it might have been confidently predicted that he would do. The selection of a writer of the type of Sir H. Johnston to undertake such an important and difficult task reflects, however, to a certain extent on the methods and ways of professed naturalists. Had one of the latter class been entrusted with the work, it is only too likely that he would have produced a volume of the dry-as-dust style, wanting in literary skill and picturesqueness, and therefore practically unreadable by the general public. All such danger has been avoided by the selection of such a famous amateur as Sir H. Johnston, whose work is in many respects well suited to the needs of a popular *clientèle*, although we think there is somewhat too much of such "blessed words" as "alisphenoid canals," "entepicondylar foramina," &c., the significance of which will scarcely be appreciated by the class of readers the author is likely to attract.

As regards the general character and scope of his work, Sir Harry Johnston has made British mammals a peg on which to hang a long and somewhat discursive account of mammals in general, and extinct ones in particular, and it must be confessed that on many occasions he gets decidedly far away from his proper subject. In this connection it may be noticed that, although Sir Harry alludes to his work as a compilation, from the absence of references to authorities (which is a conspicuous feature throughout the volume) it might easily be imagined by the uninitiated reader that many of the theories (often alluded to as though they were facts) were the author's own, a case in point being the presumed African origin of certain elements in the South American fauna.

For our own part, we confess that we do not like the plan of mixing up the later extinct forms with those still living, as it tends to confusion and to give an exaggerated idea of the extent of the British fauna,

which is now essentially of an island type. This, however, is purely a matter of opinion, and the author has a perfect right to follow his own inclinations in this respect. Even here, however, he makes a serious blunder at starting. For in the table of "epochs," on p. 16, he includes the Pleistocene in the "Tertiary" instead of in the "Quaternary."

Although confessedly an amateur, and to a great extent, therefore, unacquainted with the *technique* and details of his subject, Sir H. Johnston has apparently such overweening confidence in his own abilities and knowledge that he has scorned specialist aid in the revision of his proofs, which are consequently disfigured by a host of blunders and omissions. That the study of British mammals has not been advanced by his labours is a mild way of putting the matter. It might be urged, indeed, that in a popular work this was not to be expected, and were it not for the ambitious and comprehensive style in which the task has been attempted, there might be some justification for this plea. As it is, there is none.

To justify this indictment, we proceed to quote a selection from the errors and omissions.

Firstly, as regards mammals in general, we notice on p. 19 that Platanistid dolphins are stated to occur only in the Amazon and Ganges. On p. 48 a vague theory of the use of the folds in the throat of the porpoises is alluded to in a foot-note, but no reference at all is made to the main use of these structures, namely, to form a dilatable pouch for the temporary reception of prey. On p. 84 we find the term *calcaneum* employed instead of *calcar* for the supporting style in a bat's flying membrane. Three pages earlier (p. 81) we find it confidently stated that bats never produce more than two young at a birth, whereas the occurrence of three or four in an American family was announced early in 1902 by Mr. Thomas, and later on in the same year by Mr. Lyon. On p. 135 the astounding suggestion is made that the British fossil panda (*Ælurus anglicus*) may have been more nearly allied to *Æluropus* than to the members of the genus in which it is placed. Apparently the author has no conception of the differences between the molar teeth of the two genera. On p. 166 it is stated that hyænas have only one pair of lower premolars, while, on the next page, the lower carnassial tooth of the spotted hyæna is said to be "reduced in size" as compared with that of the striped species, whereas precisely the reverse of this is the case. These are not all the instances of the author's lack of knowledge concerning mammalian dentition, for on p. 115 we find no reference to the opinion that the functional dentition of marsupials represents the milk series, or to a paper published a few years ago in the Zoological Society's *Proceedings* in which it was attempted to show that the number of premolars in the same group is four instead of three. We should also much like to know what authority there is for the statement (p. 353) that the Indian nilgai is the nearest living ally of the oxen. Even more astonishing is the assertion, on the next page, that the bison take their origin from the Oriental bibovine group of cattle, as represented by the gaur and banting. Apparently the author is un-

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acquainted with the fact that the conformation of the skull and the position of the horns are quite enough to refute this, apart from the circumstance that the "bibovines" exhibit a specialised, and the bisons the primitive, type of coloration. Again, on p. 351, we are told that the ewes of the European mufion are invariably hornless.

Many remarks might be made with regard to the author's knowledge of extinct mammals, but perhaps it will suffice to indicate the extent of this by reference to a passage on p. 270, where we are calmly told that the Pliocene brachyodont *Rhinoceros etruscus* is identical with the Pleistocene hypsodont *R. leptorhinus*! If this be not enough, we may refer to p. 291, where it is suggested that the extinct Sedgwick's deer may be allied to the Oriental rusine group. Evidently the author does not know the difference between a "brow-tined" and a "fork-tined" antler, as, indeed, may be gathered from certain statements in regard to supposed roe-antlers later on in the work.

Passing on to the modern British fauna, a few lines may be devoted, in the first place, to the author's nomenclature. We are glad to see that, in the case of the generic names of the bats, modern usage is followed. We also note that in this group the author follows the "*Scomber-scomber*" usage, thus calling one species *Myotis myotis*. This being so, we fail to see why the otter and the badger are not respectively termed *Lutra lutra* and *Meles meles*, in place of *Lutra vulgaris* and *Meles taxus*. It is well to be consistent even in nomenclature! Still more surprised are we to find the weasel designated *Putorius vulgaris* on p. 161 and *P. nivalis* in the illustration on p. 163.

In the notice of Bechstein's bat, the author states that Mr. Millais took a specimen in 1902, whereas he should have written 1901, and he seems unaware that in the former year a note was published in regard to a specimen taken in 1886. In treating of the smaller rodents, the author has totally ignored the work of modern specialists. For instance, in the case of the squirrel, there is no mention of the fact that the British animal is regarded by specialists as a distinct form, which should be known as *Sciurus leucurus* if ranked as a species, or as *S. vulgaris leucurus* if a subspecies. Again, although mention is made of its seasonal colour-changes, the important fact that there is a curious difference in regard to the shedding of the coat on the body and on the tail is left unrecorded. Full reference should have been made to the paper by Mr. Thomas on this subject. Worse remains to be told in the case of the mice. In describing the wood-mouse, the author records and names five local races. Evidently, therefore, he considers such races worthy of notice. On turning, however, to the common mouse, we find no mention of the Hebridean wild form described by Captain Barrett-Hamilton as *Mus muralis* in 1899, while there is an equal lack of reference to the local forms of the harvest-mouse named by the same writer in that and the following year, and consequently the omission of the full title of the British race, namely *M. minutus minimus*. Neither is there any reference to the fact that the British short-tailed field-vole should be known as *M. agrestis neglectus*, as

pointed out by Captain Hamilton in 1896. Bearing in mind what has been said with regard to the local races of the wood-mouse, we can only attribute these omissions to ignorance on the part of the author—ignorance for which there is not the faintest shadow of an excuse in these days of up-to-date Zoological Records.

Other instances of this type might be quoted. We pass on to notice, however, that on p. 296 the author has actually reproduced figures of certain antlers from Scotland, published by Mr. Millais as those of the roe-buck, although it has long since been shown that the specimens in question are antlers of the South American pampas-deer which by some means had got into Scotland. Not content with this, Sir Harry proceeds to argue that these "fork-tined" antlers approximate to the red deer type. Evidently his lack of knowledge of antlers is on a par with that shown in connection with zoological literature.

After so much fault-finding, we are glad to record that the author calls the ancient wild ox by its proper name of aurochs, although, here again, if he would but take the trouble to read the descriptive label in the Natural History Museum he would find that his views as to the relationship of the white park cattle (which he will persist in calling wild) are far from being up to the level of those who know anything about the subject, and are acquainted with the meaning of albinism.

Among the most attractive features of the work are the coloured plates, all of which have been reproduced from original water-colour sketches by the author himself, whose artistic taste and powers are well known. Unlike the pictures of animals which we are accustomed to see in zoological publications, these sketches are designed from a decidedly artistic standpoint, and are admirably suited to a work of this nature. Many of the illustrations in black and white are also by the author, and are, for the most part, both life-like and artistic. We should, however, like to know what authority there is for depicting the long-eared bat (p. 105) with the ears depressed, while the wings are extended.

In conclusion, we may say that, had the author contented himself with writing a book of a less pretentious style, and ignored anatomy and subspecies, we should have had less cause to find fault with his effort. As it is, a thoroughly accurate, complete, and up-to-date book on British mammals has yet to be written.

R. L.

THERMODYNAMICS.

Treatise on Thermodynamics. By Dr. Max Planck. Translated by Alexander Ogg, M.A. Pp. xii+272. (London: Longmans, Green and Co., 1903.) Price 7s. 6d. net.

THE important part played by thermodynamics in modern physics, and especially in chemistry, is a sure guarantee that an English translation of Prof. Planck's work will receive a warm welcome in this country. It deals with the first and second laws, changes of state systems defined by any number of